CURRICULUM VITAE

TYLER J. JARVIS

Education

Ph.D: 1994. Princeton University, mathematics
M.A: 1992. Princeton University, mathematics
M.S: 1990. Brigham Young University, mathematics
B.S: 1989. Brigham Young University, mathematics, summa cum laude

Academic Experience

2006–present: Professor, Brigham Young University
2012–2013: Visiting Scholar, University of Utah
2010: Visiting Scholar, Max-Planck-Institut für Mathematik, Bonn, Germany
2007: Visiting Scholar, Mittag-Leffler Institute, Djursholm, Sweden
2001–2006: Associate Professor, Brigham Young University
2001–2002: Visiting Scholar, Boston University
1996–2001: Assistant Professor, Brigham Young University
1994–1996: Assistant Professor, Mississippi State University

Administrative Experience

2024–Present: Chair, Data Science Committee, Brigham Young University College of Computation, Math, and Science
2013–Present: Cofounder and Director, Applied and Computational Mathematics Program (ACME), Brigham Young University
2006–2017: Cofounder and Codirector, BYU–NSF Center for Undergraduate Research in Mathematics
2006–2012: Department Chair, Brigham Young University Department of Mathematics
2008–2009: Member, Mathematics Steering Committee, Utah State Office of Education
1996–2007: Member, Board of Directors, Meyer and Liechty Corporation
2005–2006: Chair, Rock Canyon School Community Council (elected office)
1999–2006: Director of Graduate Studies, Department of Mathematics, Brigham Young University

Awards and Recognitions Received

2024: Award for an Exemplary Program or Achievement in a Mathematics Department, American Mathematical Society, awarded to the BYU Applied and Computational Mathematics Emphasis (ACME) Program, which I cofounded and direct. This is awarded to one program per year, nationally.
2022: American Mathematical Society Annual Lecture on Education, Inaugural Speaker.
2019: Award for Distinguished Service. College of Physical and Mathematical Sciences, Brigham Young University
2016: Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics, Mathematical Association of America (Each year three recipients are chosen from approximately 20,000 members)
2016: Karl G. Maeser Excellence in Teaching Award. Brigham Young University
2015: Mathematics Program that Makes a Difference, American Mathematical Society, award for the BYU–NSF Center for Undergraduate Research in Mathematics, which I codirected. (At most two programs are selected nationally each year.)
2013: Award for Distinguished Teaching of Mathematics, Kenneth C. Savage Foundation

1995: Faculty Early Career Development Award (NSF CAREER), National Science Foundation (the National Science Foundation's most prestigious awards in support of early-career faculty)

External Funding Received

2021–2025: Tula Health, "Noninvasive health sensing."
2016–2020: National Science Foundation DMS-1564502, "Focused Research Group: Crossing the Walls in Enumerative Geometry." Collaborative project with the University of Michigan, Columbia, MIT, and Stanford.
2013–2017: National Science Foundation DUE-1323785, "TUES: A New Curriculum in Applied and Computational Mathematics."
2012–2017: National Science Foundation DMS-1148695: "Center for Mentoring Undergraduate Research in Mathematics."
2010–2012: National Security Agency H98230-10-1-0181: "Group Actions, Orbicurves, and Topological Field Theory."
2006–2010: National Science Foundation DMS-0636648: "Center for Mentoring Undergraduate Research in Mathematics."
2006–2009: National Science Foundation DMS-0605155: "Stringy Invariants, Orbicurves, and Topological Field Theory."
2001–2005: National Science Foundation DMS-0105788: "Higher Spin Curves and Cohomological Field Theories."
1998–2000: National Security Agency MDA904-99-1-0039: "Moduli of Higher Spin Curves."
1995–1998: National Science Foundation, Early Career Development Award (NSF CAREER) DMS-9501617: "Moduli of Generalized Spin Curves; Class Size and Calculus Learning."

Peer Reviewed Articles

(1) Parkinson, E., Wall, K., Slagle, J., Treuhaft, D., de la Bruere, X., Goldrup, S., Keith, T., Call, P., and Jarvis T. J. Chebyshev Subdivision and Reduction Methods for Solving Multivariable Systems of Equations. *Journal of Symbolic Computation.* **128** (2025), 102392.
(2) Rogers, K., Yu, H., Cho, S., Fulda, N, Yorgason, J., and Jarvis, T. J. Decoupling the Backward Pass Using Abstracted Gradients. *Proceedings of the 16th International Conference on Agents and Artificial Intelligence: ICAART.* **3** (2024), 507–518.
(3) Jarvis, T. J. Restoring Confidence in the Value of Mathematics by Teaching Undergraduates Math They Will Use. *Notices of the American Mathematical Society.* **70** (2023) no. 1, 105—113.
(4) King, A., Murri, J., Callahan, J., Russell, A., & Jarvis, T. J. Mathematical Analysis of Redistricting in Utah. *Statistics and Public Policy.* **9** (2022) no. 1, 136–148.
(5) Parkinson, S., Ringer, H., Wall, K, Parkinson, E., Erekson, L., Christensen, D., & Jarvis, T. J. Analysis of Normal-Form Algorithms for Solving Systems of Polynomial Equations *Journal of Computational and Applied Mathematics* **411** (2022), Article 114235.
(6) Jorgensen, J., Christensen, J., Jarvis, T. J., & Hart, G. A general algorithm for calculating the irreducible Brillouin zone. *Communications in Computational Physics.* 31 (2022) no. 2, 495–515.
(7) Jarvis, T. J., Clough, J., Cox, J., Petersen, K., Sailsbery, M., Robertson, C., Moncur, T., Palmer, K., & Lund, D. Using Survey Data and Mathematical Modeling to Prioritize Water Interventions in Developing Countries. *Water Resources Management.* **35** (2021) no. 2, 745–756.
(8) Francis, A., Jarvis, T. J., & Priddis, N. A brief survey of FJRW theory. *Advanced Studies in Pure Mathematics.* **83** (2019), 19–53.
(9) Fan, H. J., Jarvis, T. J., & Ruan, Y. A Mathematical Theory of the Gauged Linear Sigma Model. *Geometry and Topology.* **22** (2018), 235–303.

(10) Fan, H. J., Jarvis, T. J., & Ruan, Y. The Moduli Space in the Gauged Linear Sigma Model. *Chinese Annals of Mathematics. Series B. Special Issue on Nonabelian Gauged Linear Sigma Models.* **38B** no. 4 (2017), 913–936.

(11) Edidin, D., Jarvis, T. J., & Kimura, T., Chern Classes and Compatible Power Operations in Inertial K-theory. *Annals of K-Theory.* **2** no. 1 (2017), 73–130.

(12) Fan, H. J., Francis, A., Jarvis, T. J., Merrell, E. & Ruan, Y. Proof of Witten's D_4 Integrable Hierarchies Conjecture. *Chinese Annals of Math. series B* **37** (2016) no. 2, 175–192.

(13) Edidin, D., Jarvis, T. J., & Kimura, T., A Plethora of Inertial Products. *Annals of K-Theory* **1** (2016) no. 1, 85–108.

(14) Fan, H. J., Jarvis, T. J., & Ruan, Y. The Witten Equation, Mirror Symmetry, and Quantum Singularity Theory. *Annals of Mathematics* **178** (2013), 1–106.

(15) Francis, A., Jarvis, T. J., Johnson, J. D., Suggs, R., Landau-Ginzburg Mirror Symmetry for Orbifolded Frobenius Algebras. *Proceedings of Symposia in Pure Mathematics.* **85** (2012), 333–353.

(16) Jarvis, T. J., Lang, W. E., and Ricks, J. R. Integral Models of Extremal Rational Elliptic Surfaces. *Communications in Algebra* **40**:10 (2012), 3867–3883.

(17) Fan, H. J., Jarvis, T. J., & Ruan, Y. Quantum Singularity Theory for A_{r-1} and r-Spin Theory. *Annales de l'Institut Fourier.* **61** no. 7 (2011), 2781–2802.

(18) Edidin, D., Jarvis, T. J., & Kimura, T. Logarithmic Trace and Orbifold Products. *Duke Mathematical Journal.* **153** no. 3 (2010), 427–473.

(19) Fan, H. J., Jarvis, T. J., & Ruan, Y. Geometry and Analysis of Spin Equations. *Communications on Pure and Applied Mathematics.* **61**, no. 6 (2008), 745–788.

(20) Jarvis, T. J., Kaufmann, R., & Kimura, T. Stringy K-theory and the Chern Character. *Inventiones Mathematicae.* **168**, no. 1 (2007), 23–81.

(21) Jarvis, T. J., Lang, W. E., Petrosyan, N., Rimmasch, G., Rogers, J., & Summers, E. D. Classification of Singular Fibres on Rational Elliptic Surfaces in Characteristic Three. *Communications in Algebra*, **33** (2005), 4533–4566.

(22) Jarvis, T. J., Kimura, T. & Vaintrob, A. The Moduli Space of Stable r-Spin Maps and Quantum Cohomology. *Comm. in Mathematical Physics.* **259** no. 3 (2005), 511–543.

(23) Jarvis, T. J., Kaufmann, R., & Kimura, T. Pointed Admissible G-covers and G-equivariant Cohomological Field Theories. *Compositio Mathematica,* **141** (2005), 926–978.

(24) Jarvis, T. J. & Tanton, J. The Hairy Ball Theorem via Sperner's Lemma. *American Mathematical Monthly,* **111** no. 7 (2004), 599–603.

(25) Abramovich, D. & Jarvis, T. J. Moduli of Twisted Spin Curves. *Proceedings of the American Mathematical Society,* **131** no. 3 (2003), 685–699.

(26) Jarvis, T. J. & Kimura, T. Orbifold quantum cohomology of the Classifying Space of a Finite Group. In A. Adem, J. Morava, & Y. Ruan (Eds.). *Orbifolds in Mathematics and Physics (Madison, WI, 2001)*, Contemporary Mathematics, **310** (2002), 123–134. Providence, R.I.: American Mathematical Society.

(27) Jarvis, T. J., Kimura, T. & Vaintrob, A. Gravitational Descendants and the Moduli Space of Higher Spin Curves. In E. Previato (Ed.), *Advances in Algebraic Geometry Motivated by Physics.* Contemporary Mathematics **276** (2001), 167–177. Providence, R.I.: American Mathematical Society.

(28) Jarvis, T. J. Picard Group of the Moduli of Higher Spin Curves. *New York Journal of Mathematics,* **7** (2001), 23–47.

(29) Jarvis, T. J., Kimura, T. & Vaintrob, A. Moduli Spaces of Higher Spin Curves and Integrable Hierarchies. *Compositio Mathematica,* **126** no. 2 (2001), 157–212.

(30) Jarvis, T. J., Kimura, T. & Vaintrob, A. Tensor Products of Frobenius manifolds and Moduli Spaces of Higher Spin Curves. In G. Dito & D. Sternheimer (Eds.), *Conferénce de Moshé Flato 1999*, vol. 2 (2000), (145–166). Dordrecht, Netherlands: Kluwer.

(31) Jarvis, T. J. Geometry of the Moduli of Higher Spin Curves. *International Journal of Mathematics,* **11** no. 5 (2000), 637–663.

(32) Jarvis, T. J. Compactification of the Universal Picard over the Moduli of Stable Curves. *Mathematische Zeitschrift,* **235** (2000), 123–149.
(33) Jarvis, T. J. Torsion-free Sheaves and Moduli of Generalized Spin Curves. *Compositio Mathematica,* **110** no. 3 (1998), 291–333.
(34) Barrett, W. W. & Jarvis, T. J. Spectral Properties of a Matrix of Redheffer. *Linear Algebra and Its Applications,* **162–164** (1992), 673–683.
(35) Cox, P. A., Cromar, S. & Jarvis, T. J. Underwater Pollination, Three-dimensional Search, and Pollen Morphology: Predictions from a Supercomputer Analysis. In S. Blackmore & S. H. Barnes (Eds.), *Pollen and Spores: Patterns of Diversification* (1992), 363–375. Oxford University Press.
(36) Cox, P. A., Cromar, S. & Jarvis, T. J. Underwater pollination and Three-dimensional Search: A super computer approach. In K.R. Billingsly, H.U. Brown III, & E.S. Derohanes (Eds.), *Computer Assisted Analysis and Modeling on the IBM 3090,* Vol. 2 (1991). 569–582. MIT Press.
(37) Jarvis, T. J. A Dominant Negative Eigenvalue of a Matrix of Redheffer. *Linear Algebra and Its Applications,* **142** (1990), 141–152.

Books

(38) Jarvis, T. J. & Priddis, N. (Eds.). *Singularities, Mirror Symmetry, and the Gauged Linear Sigma Model*, Contemporary Mathematics, **763** (2021). American Mathematical Society, Providence, RI.
(39) Humpherys, J., Jarvis, T. *Foundations of Applied Mathematics Volume 2: Algorithms, Approximation, Optimization.* Society for Industrial and Applied Mathematics. Philadelphia, PA. 788 pages (2020).
(40) Humpherys, J., Jarvis, T., & Evans, E. *Foundations of Applied Mathematics Volume 1: Mathematical Analysis.* Society for Industrial and Applied Mathematics. Philadelphia, PA. (2017).
(41) Jarvis, T. J., Kimura, T. & Vaintrob, A. (Eds.). *Proceedings of the Conference on Gromov-Witten Theory of Spin Curves and Orbifolds*, Contemporary Mathematics, **403** (2006). American Mathematical Society, Providence, RI.

Other publications

(42) Charles, G.-U., et al. [including Jarvis, T. J.], Amicus Brief of Mathematicians, Law Professors, and Students. *Rucho v. Common Cause*, 588 U.S. 18–422, 18–726 (2019).
(43) Humpherys, J., Jarvis, T.J., and Evans, E. (Eds.) *Foundations of Applied Mathematics, Lab Manuals.* `foundations-of-applied-mathematics.github.io` (2016–2023).
(44) Jarvis, T. J. That's how the light gets in. *BYU Magazine*, Fall 2013, 24–30.
(45) Jarvis, T. J. and Jarvis, H. B. Gambling: What are the odds? *BYU Magazine*, Spring 2001, 48–52.
(46) Jarvis, T. J. & Jarvis, H. B. Gambling. In D. Paul & G. Hatch (Eds.), *Enter to Learn.* (1999) 288–299. Brigham Young University Press.

In review

(47) Transtrum, M., Hart, G., Jarvis, T. J., Whitehead, J. Generalized Aliasing Explains Double Descent and Informs Model Design. Physical Review X.
(48) Fan, H., Jarvis, T. J., Ruan, Y., *Quantization of Singularity Theory.* Research Monograph. American Mathematical Society.

Patents

(1) Williams, A. and Jarvis, T. J. (2023) U.S. Provisional Patent Application No. 63/601,335 filed 11/21/2023 as *Fourier–Kalman State (FoKS): A Flexible Framework for Modeling and Prediction of Periodic Systems.* Non-provisional Docket Number JTS0003, filed 11/20/2024.

(2) Williams, A., Jarvis, T. J., and Davis, R. (2023) U.S. Provisional Patent Application No. 63/601,494 filed 11/21/2023 as *Integrated Path Approximation: A Novel Approach to Modeling Macroscopic Photon Absorbtion in Highly Scattering Media.* Non-provisional Docket Number JTS0005, filed 11/20/2024.

(3) Jarvis, T. J., Terry, W., Lunceford, B., Tolman, L., and Davis, M. (2023) U.S. Provisional Patent Application No. 63/612,791 filed 12/20/2023 as *Beer–Lambert inversion for estimating blood analytes from spectrometer signal.* Non-provisional Docket Number JTS0007, filed 12/20/2024.

(4) Jarvis, T. J., King, A., and Lunceford, B. (2024) U.S. Provisional Patent Application No. 63/656,277 filed 6/5/2024 as *Phase Lock Averaging for removing noise from almost-periodic signals with non-constant frequency and irregular shape.*

(5) Jarvis, T. J. and Lunceford, B. (2024) U.S. Provisional Patent Application No. 63/703,693 filed 10/4/2024 as *Optimal Wavelength Standardization.*

(6) Jarvis, T. J. and Terry, W. (2024) U.S. Provisional Patent Application No. 63/706,426 filed 10/11/2024 based on BYU Invention Disclosure No. 2024-029, *Dynamic Resampling of Pulsatile Signals.*